CLAIMS

1. A protected faceplate structure of a field emission display device, said protected faceplate structure comprising:

a) a faceplate of a field emission display device, said faceplate adapted to have phosphor containing wells disposed above one side thereof; and

b) a barrier layer disposed over said one side of said faceplate, said barrier layer adapted to prevent degradation of said faceplate due to electron bombardment by electrons directed towards said phosphor containing wells.

2. The protected faceplate structure of a field emission display device of Claim 1, wherein said faceplate is comprised of a high-sodium glass substrate.

3. The protected faceplate structure of a field emission display device of Claim 1, wherein said barrier layer is comprised of a substantially transparent, electron-damage resistant material.

4. The protected faceplate structure of a field emission display device of Claim 1, wherein said barrier layer has a thickness sufficient to prevent substantial penetration of said electrons through said barrier layer such that said electrons do not impinge said faceplate.

5. The protected faceplate structure of a field emission display device of Claim 1, wherein said barrier layer is selected from the group consisting of silicon dioxide, Al_2O_3, CrO_x, ZnO, Si_3N_4, SiO_2, TaO_5, Tin Oxide, ITO, ZrO_2, Y_2O_3, TiO_2, and MgO and combinations thereof.

6. The protected faceplate structure of a field emission display device of Claim 5, wherein said barrier layer has a thickness of approximately 100 nanometers.

7. The protected faceplate structure of a field emission display device of Claim 1, wherein said barrier layer prevents the migration of contaminants from said faceplate into said field emission display device.

8. The protected faceplate structure of a field emission display device of Claim 2, wherein said barrier layer prevents the migration of sodium from said faceplate into said field emission display device.

9. The protected faceplate structure of a field emission display device of Claim 1, wherein said barrier layer is electrically conductive.

10. A protected cathode substrate structure of a field emission display device, said protected cathode substrate structure comprising:

a) a cathode substrate of a field emission display device, said cathode substrate adapted to have an electron emitting structure disposed above one side thereof; and

b) a barrier layer disposed over said one side of said cathode substrate, said barrier layer adapted to prevent degradation of said cathode substrate due to electron bombardment by electrons originating from said electron emitting structure.

11. The protected cathode substrate structure of a field emission display device of Claim 10, wherein said cathode substrate is comprised of a high-sodium glass.

12. The protected cathode substrate structure of a field emission display device of Claim 10, wherein said barrier layer is comprised of a substantially transparent, electron-damage resistant material.

13. The protected cathode substrate structure of a field emission display device of Claim 10, wherein said barrier layer has a thickness sufficient to prevent substantial penetration of said electrons through said barrier layer such that said electrons do not impinge said cathode substrate.

14. The protected cathode substrate structure of a field emission display device of Claim 10, wherein said barrier layer is comprised of silicon dioxide, Al_2O_3, CrO_x, ZnO, Si_3N_4, SiO_2, TaO_5, Tin Oxide, ITO, ZrO_2, Y_2O_3, TiO_2, and MgO and combinations thereof.

15. The protected cathode substrate structure of a field emission display device of Claim 14, wherein said barrier layer has a thickness of approximately 100 nanometers.

16. The protected cathode substrate structure of a field emission display device of Claim 10, wherein said barrier layer prevents the migration of contaminants from said cathode substrate into said field emission display device.

17. The protected cathode substrate structure of a field emission display device of Claim 11, wherein said barrier layer prevents the migration of sodium from said cathode substrate into said field emission display device.

18. The protected cathode substrate structure of a field emission display device of Claim 10, wherein said barrier layer is electrically conductive.

19. A method for protecting a substrate structure of a field emission display device, said method comprising the steps of:

a) providing a substrate structure of a field emission display device; and

b) disposing a barrier layer over said substrate structure, said barrier layer adapted to prevent degradation of said substrate structure due to bombardment by electrons.

20. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein said substrate structure comprises a faceplate of said field emission display device.

21. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein said substrate structure comprises a cathode substrate of said field emission display device.

22. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein step a) comprises providing a high-sodium glass substrate structure for said field emission display device.

23. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein step b) comprises disposing said barrier layer over said substrate structure wherein said barrier layer is comprised of a substantially transparent, electron-damage resistant material .

24. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein step b) comprises disposing said barrier layer over said substrate structure such that said barrier layer has a thickness sufficient to prevent substantial penetration of said electrons therethrough.

25. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein step b) comprises disposing a barrier layer over said substrate structure wherein said barrier layer is selected from the group consisting of silicon dioxide, Al_2O_3, CrO_x, ZnO, Si_3N_4, SiO_2, TaO_5, Tin Oxide, ITO, ZrO_2, Y_2O_3, TiO_2, and MgO and combinations thereof.

26. The method for protecting a substrate structure of a field emission display device as recited in Claim 25 wherein step b) comprises disposing said barrier layer to a thickness of approximately 100 nanometers over said substrate structure.

27. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein step b) comprises disposing said barrier layer over said substrate structure wherein said barrier layer prevents migration of contaminants from said substrate structure into said field emission display device.

28. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein step b) comprises disposing said barrier layer over said substrate structure such that said barrier layer prevents migration of sodium from said substrate structure into said field emission display device.

29. The method for protecting a substrate structure of a field emission display device as recited in Claim 19 wherein step b) comprises disposing an electrically conductive barrier layer over said substrate structure.

30. The protected faceplate structure of a field emission display device of Claim 1, wherein said barrier layer includes a selectively light absorbing component.

31. The protected faceplate structure of a field emission display device of Claim 30, wherein said selectively light absorbing component is selected from the group consisting of dyes and pigments.

32. The protected faceplate structure of a field emission display device of Claim 30, wherein each subpixel of said faceplate includes a different selectively light absorbing component.

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36. The method for protecting a substrate structure of a field emission display device as recited in Claim 19, wherein said barrier layer includes a selectively light absorbing component.

37. The method for protecting a substrate structure of a field emission display device as recited in Claim 36, wherein said selectively light absorbing component is selected from the group consisting of dyes and pigments.

38. The method for protecting a substrate structure of a field emission display device as recited in Claim 36, wherein each subpixel of said faceplate includes a different selectively light absorbing component.